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Post-ecological discourse in the making

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Abstract: This article analyses the discourse of 15- to16-year-old Swiss junior high school students in order to understand public discourse on the environment and environmental protection. Discourse analysis reveals four interpretive repertoires as the building blocks for the so-called post-ecological discourse, which can be used to describe important aspects of current ways of talking about ecological issues in Europe. We show that 10 theoretically identifiable dimensions of this discourse can be understood in terms of a mutual interplay between the four interpretive repertoires. Post-ecological discourse in today's (Swiss) society appears to be at its core a loss-of-control-discourse, which leads (in our students) to a latent eco-depression. Thus, the public understanding of science can be affected by unintended consequences of the talk itself (in this case an unintended environmental depression), that is, by the inherent characteristics of the involved repertoires, here especially the so-called folk science repertoire. Fostering public understanding of science is thus not merely a question of providing the public with scientific 'facts'. It is also an issue of paying attention to the available discursive repertoires. If necessary, viable alternative repertoires may have to be offered. In school, for example, conversations about the nature of science, and about complexity and applied ethics might help students learn new interpretive repertoires and how to mobilize these in talking about the environment and environmental protection.

Keywords: discourse analysis, ecology, environmental education, interpretive repertoires, post-ecologism, science education

1. Introduction

This study is committed to a strictly repertoire-driven discourse analysis of environment and environmental protection talk of 15 to 16 year-old Swiss high school students. The structure of talk itself is the focus of the study as it has been assumed that it can reveal some of the important building blocks of Swiss peoples' talk in general about the environment and environmental protection.

In previous research, environmental arguments used in Swiss society have been shown to closely match students' talk in terms of content and it has also been demonstrated that these arguments emerge from a limited number of discursive resources - four already indentified so-called *interpretative repertoires* – offered by language to its speakers (Authors, 2009). In the analysis presented in this article, the research question is whether the very same resources can be used in order to understand the so-called post-ecologist discourse as it has been identified in European, particularly German-speaking, countries (Blüh-

dorn et al., 2006). Ten discursive dimensions of post-ecologism, as they have been proposed by Nikel and Reid (2006), are used as a grid of analysis.

This strictly repertoire-driven form of discourse analysis includes inherently deductive strategies, and we are quite aware of the fact that ethnomethodologists, in particular, have questioned it with arguments "that the in situ details of everyday life are ignored at the risk of reducing social life to recorded talk and conversational sequencing" (Holstein and Gubrium, 2005:488). However, this approach has been chosen because of its core idea to take the discourse of a group of students as a microcosm, a "discursive laboratory", in order to better understand societal talk. Thereby, in particular, the transferability (Roth, 2005) of the four already identified interpretive repertoires to a broader societal context is tested.

By adopting this method, some of the assumptions frequently associated with other types of discourse analysis are not met. For example, the individual meaning speakers attribute to their talk is not addressed (cf. Milne, 2009) and it is taken for granted that individuals usually draw on repertoires in a highly variable and inconsistent way (Reynolds and Wetherell, 2003). The inner- and inter-individual differences of the students' talk are not the focus of the analysis in this article. Inherently-shared language rather than individual subjectivity is the area of interest. Language generally and interpretive repertoires particularly are seen as specifically constituting resources that are accessible to every linguistically competent member of society; speakers both mobilize and are subject to the possibilities of their common language.

2. The context of the study

The material analyzed in this study was collected as a part of the meta-analysis of a teacher education project. The pre-service teachers designed and conducted a survey to find out what 15 to 16 year-old boys and girls from 47 school classes in Central Switzerland think about environmental issues. Three of the school classes involved in this pedagogical project were investigated. These three classes, of about 20 to 25 students each, were chosen for three reasons. Firstly, the three class teachers agreed to participate, together with their classes, in this intense and time-consuming research project. Secondly, cursory assessment of survey results showed that two of these three classes responded with above average positive answers to questions concerning their environmental attitudes, whereas one class answered the questions more negatively. Thirdly, the three classes were from three schools located in three regions of Central Switzerland: an urban, rural, and tourist region. As there are few private schools in Switzerland and no limits on access to these regional schools, classes showed no particular pattern of students; instead the students in the classes reflect the social-cultural background of their region.

In each participating class, the class's results from the survey project were presented as a starting point for discussions that would later become data for the study discussed in this article. The survey results were shown on transparencies using graphs to display the class mean in comparison to the means of the other 46 participating classes. Each 45-minute discussion was videotaped. Based on an initial analysis of the videotapes, 12 students were selected for in-depth videotaped interviews. The selection of students was based on the following recommendations for participation selection in naturalistic research (Lincoln

and Guba, 1985): participants were willing to express themselves without hesitation and they gave interesting, largely consenting, or controversial answers during the discussion.

3. The discourse of post-ecologism

The socio-political framework of post-ecologism has been proposed as a means to articulate the dilemma of modern democracies facing the challenge of sustainability (Blühdorn, 2000). On the one hand, environmental concerns in European economies and politics have recently taken unprecedented prominence and many eco-political measures are being considered or are in the process of being implemented. On the other hand, "the key principles governing Western practices of production, circulation, exchange and consumption remain immutable" (Blühdorn and Welsh, 2006: 186). This dilemma is, according to Blühdorn and colleagues, especially present in German-speaking countries. In these countries, for a number of cultural-historical reasons, values and virtues of green movements have been embraced more intimately and absorbed more deeply than in many other countries. In the post-ecological framework, the term ecologism is used to stress the radical and ideological elements of environmental movements in these countries. Thus it refers to a modernist ideology of unity seeking to preserve the environment in absolute terms of holy nature, global ecological equilibrium, and an intrinsic, undisputable value of nature (Blühdorn and Welsh, 2006). As in other concepts of ecologism (cf. Smith, 1998), this ideology is not based on the assumption that humans hold a privileged or central position in social and political evaluation.

Post-ecologist culture seeks to escape the ecologist dilemma by a "performative simulation" of the ecological credo. Politics and public opinion demonstratively adhere to an idealistic vision of sustainability while at the same time society and its individuals perpetuate the unsustainable practice of "sustaining the unsustainable" (Blühdorn, 2007).

Cultural-historical arguments about the correctness of the post-ecologist diagnosis (cf. Hausknost 2008; Humphrey 2006, 2009) are not the concern of this paper. Although the argument in this article does not contest that the students live in a post-ecologist world, many traits of Swiss societal life can nevertheless be interpreted in terms of post-ecologism. For example, when questioned in consumer surveys (cf. Accenture 2007), Swiss people respond that the environment and environmental protection are important issues for them and that they are ready to live in an environmentally-friendly manner. Yet evidence provided in the widely read *Sorgenbarometer*, the Swiss "Barometer of Concerns," published by the, Swiss bank, *Credit Suisse* (Credit Suisse, 2008) shows that while environmental protection was the most important societal issue for 74% of the Swiss surveyed in 1988, during the following years its importance had decreased dramatically for the Swiss by 2006 to 7%. Other issues are now of major concern, such as unemployment (66%), health and health costs (55%), and rent (51%).

Nevertheless, the environmental situation in Switzerland remains unsatisfactory. Though ongoing progress can been seen in concrete aspects like the improvement of water quality, waste disposal, and certain aspects of air pollution, this progress—mostly realized by political measures and technological innovation—has been constantly undermined by the increasing pressure put on the environment as a result of the Swiss way of life and consumerism. For example, the volume of private traffic has doubled

since 1970 and the volume of industrial traffic has tripled. In addition, Swiss people consume 233 liters of water per person per day and produce 660 kilograms of waste per person per year. Moreover, the consumption of end consumer energy has risen 30% during the last 15 years and the gross domestic product has also increased by more than 10% (BAFU and BFS, 2007).

Such aspects of Swiss society can be interpreted as indicators for a post-ecological culture that the students live in and encounter. Indeed, the qualitative content analysis of the students' environment and environmental protection discourse has revealed many aspects of post-ecologism as they are listed in Table 1 (Author 2008). Results reminiscent of this constellation can also be found in other research studies on students' attitudes toward the environment and environmental protection, although they are not made explicit as such (Jenkins and Pell, 2006). In addition, the same pattern can essentially be seen in a body of studies in a variety of cultural contexts (e.g. Chu et al., 2007).

Nevertheless, the content approach remains unsatisfactory because it relies on similarities that are in many ways incomplete and contingent. In this study, Table 1 is adopted not as a table of content but as a grid of analysis. By providing excerpts of the class discussions and interviews, the 10 discursive dimensions are exemplified and validated in a systematic approach. The way in which students' discourse emerges from the interplay and the various combinations of the four fundamental interpretive repertoires is demonstrated; the repertoires will be introduced in the following section.

1.	General and full acceptance of the in principle relevance of environmental issues combined with the warning that despite all undeniable seriousness, the environmental crisis must not be overstated.
2.	Replacement of the emancipatory subject-oriented notion of modernization by an efficiency-oriented, system-centred understanding wherein innovation and change have been adopted as intrinsic values.
3.	Prominence of neo-materialist and consumption-oriented patterns of identity formation.
4.	Disillusionment about the participatory revolution and increasing reliance on supposedly more efficient market mechanisms with concomitant calls for political leadership.
5.	Relegation of environmental issues on the political priority list to a position behind employment, security, economic growth, crime and immigration.
6.	Institutionalization of environmental concerns and delegation to 'experts' and 'professionals'.
7.	Reformulation of ecological problems as scientific, technological, economic or managerial issues.
8.	End of the vision of a radically different ecological society.
9.	Rejection of ecological idealism and dogmatic instance towards so-called political realism/pragmatism that asserts that we have no choice but to adapt to the supposedly non-negotiable imperatives of economic growth, technological progress and global competition.
10.	Criminalization of radical ecologists and direct eco-political action as a variant of terrorism.

Table 1. Characteristics of post-ecologism, adapted from Nikel and Reid (2006)

4. Method

4.1 Interpretive repertoires

Interpretive repertoires are fundamental content-dependent resources that speakers draw on to support their more contentious claims. Interpretive repertoires, initially identified in scientists' formal and informal talk about science (Gilbert and Mulkay, 1984), have been used extensively in Sociology and Social Psychology because they form a basis for communication. They are the recognizable routines of arguments,

descriptions and evaluations found in people's talk, which are often distinguished by familiar clichés, anecdotes and tropes. Interpretive repertoires are the building blocks people use to develop accounts and versions of significant events and through which they perform social life (Reynolds and Wetherell, 2003: 496).

In the repertoire-driven discourse analytical approach, peoples' talk is analyzed as a reflection of the possibilities that language offers to its speakers rather than as a reflection of the speakers' subjectivities (Roth et al., 2008). It is the account itself, provided by the discourse, that becomes "the primary object of research, rather than seeing it as a transparent representation of an individual's attitudes and beliefs or the true nature of events" (McKenzie, 2003: 4).

To identify possible repertoires that characterize the interview and classroom talk concerning environment and environmental protection, we began our analysis of the entire database by engaging ourselves in cycles. These cycles were comprised of independent analysis followed by daily meetings in which we compared and negotiated emerging analyses and discussed new directions for subsequent analyses. This is in fact a stepwise replication approach to establish *dependability,* the qualitative researcher's equivalent to *reliability* (Lincoln & Guba, 1985). For example, we came to the conclusion that students drew upon concepts from "folk science" and "folk psychology," as it has been described by Baron-Cohen et al. (1999). Each concept constituted a repertoire. Core examples of each repertoire were sought for the ensuing identification of all instances in the database that fell into one or the other repertoire. Using these examples, definitions and descriptions of the nature of each repertoire were established. During following meetings, we realized that both repertoires are actually special instances of what Roth and Lucas (1997) have identified as the commonsense repertoire. Using the database, we then identified all the instances that could be categorized in this hierarchical scheme, paying close attention those instances that might have required a revision of repertoire categories.

As a result of this iterative process, two core repertoires and four second-order repertoires were identified. The two core repertoires have been named *the commonsense repertoire* and *the agential repertoire* (Authors, 2009). Each of these can be split into two second-order repertoires: the commonsense repertoire into *the folk science repertoire* and *the folk psychology repertoire* and the agential repertoire into *the pragmatist repertoire* and *the control repertoire.* These repertoires constitute the analytical categories in the presented study. Each of the categories were critically analyzed which resulted in additional clarification and improvement of the concepts. In the following section, the final form of these repertoires is described and the conceptual background of each of them is provided.

4.2 The commonsense repertoire

The commonsense repertoire reflects the argument that everyday knowledge falls into folk or commonsense theories. Here, "theory" should not be understood as a "scientific theory." A commonsense (folk) theory is theory-like insofar as it is resistant to counterevidence, is committed to ontological beliefs, follows domain-specific causal principles and is coherent in its construction of the outer world. The argu-

ment that ordinary knowledge can be linked to commonsense theories is rooted in a body of empirical research (Hirschfeld and Gelman, 2004). In our database, the commonsense repertoire is mobilized when it comes to interpretation and classification of experiences in the students' life-world. This discourse articulates two dialectical tensions referred to as me|thing and me|you. The commonsense repertoire consequently splits into two second-order repertoires: folk science and folk psychology.

The folk science repertoire. The folk science repertoire tends to be at work in talk about entities of the natural world. Students' discourse concerning these entities is informed by various sources, including personal observations in the everyday world and by information garnered from the media. An important source in this context is also school, especially the content taught by teachers in science courses about the natural world. The folk science repertoire articulates these perceptions as *facts*, etymologically meaning things, events, or occurrences that have really and undeniably occurred and therefore constitute truths. The following excerpt from a classroom discussion illustrates the folk science repertoire. It begins with the response to the interviewer's question whether or not the student Justin sometimes reflects on environmental issues. In this excerpt, Justin and another student, Nicole, answer:

Justin: Well, sometimes I do reflect on them [environmental issues], especially in the context of the weather. These situations, when the weather is so extreme show you a bit about what one should have done. And one could still do, of course. This becomes clearer and you see it also frequently on TV.

Interviewer: What do you mean by "sometimes"?

Nicole: I mean, when a person suddenly realizes that the situation is different, the floods for example. Then I suddenly start to think, if we had done it differently, would there have been the same [result]?

A core metaphor for the folk science repertoire is the machine (Luhmann, 2004). A machine is identified by its elements and their interaction. In the example, the weather is a "machine." A societal consensus underlies the folk science repertoire, and also the "weather machine": if the facts are known in terms of input, operation, and output, then one can understand the "system," its function, and its control. The featured discourse interprets the output (the extreme weather situation watched on TV) as a result of a wrong input (human action) and takes for granted that another input would have resulted in a better output (no floods).

The folk psychology repertoire. The second repertoire to emerge from the commonsense repertoire is a result of the me|you tension. It enables talk about mental things, that is, talk about understanding and predicting other peoples' behavior. In the following interview excerpt, the student, Nora, talks about women and their way women recognize the importance of environmental issues.

Nora: I tend to think that women get it better. Men always have other things on their minds. Men also like cars. Somehow, they are more playful. We women want to have a fixed home base, right. Children and so on, not every woman, but most of them, and so one is restricted in some way.

Using this repertoire, each member of society is a lay psychologist (sociologist) drawing on available linguistic and cultural resources to create a kind of folk psychology: "Folk psychology involves our everyday understanding of how people work (how actions are caused by mental/intentional states)" (Baron-Cohen et al., 1999: 476). The collective consensus underlying the folk psychology repertoire can be likened to the "alter ego" metaphor, i.e. that one can use a theory of mind to constitute others' behavior and to predict their actions. In the same way that the folk science repertoire produces facts about the outer world, the folk psychology repertoire produces facts about the inner, mental world.

4.3 The agential repertoire

The second core repertoire, the agential repertoire, constitutes causal narratives between actions and outcomes. Humans have agency (the power to act), which allows them to act in and transform their social and natural worlds. The agential repertoire splits into two second-order repertoires derived from the dialectical tensions ideal|real (the pragmatist repertoire) and self|others (the control repertoire).

The pragmatist repertoire. This repertoire is used to articulate actions in terms of firstly, an ideally constituted world or secondly, the real existing world (as the students perceive it). In the following excerpt, the pragmatist repertoire is at work in support of a claim about why people persist with consumerism:

Fabian: For sure we destroy our world with our consumerism. By driving cars and so on. But it is necessary, otherwise there would be no more work. For example, if we didn't drive cars at all, then there would be problems with jobs. People couldn't work anymore. Or [take] a farmer who drives a tractor. Of course, you could cut the edge of the field by hand, although at the moment you would use a power saw. But it is a question of convenience. And clothes, everybody needs clothes. Clothes get old, are used, get holes.

In an ideal world, one kind of action might be taken (no driving of cars, cutting field borders by hand, etc.); however, in the real world, full of contingencies (employment problems, inconvenience of manual labor, natural aging of clothes), a different set of actions is considered appropriate (use cars, use a power saw, buy new clothes). In this repertoire, the term "ideal" labels a world where actions are directed at values or "mental goals." The term "real," on the other hand, describes a world where practical goals are striven for. The two discourses, ideal and real, are conceived as incompatible.

The control repertoire. The control repertoire reflects the opposition in a self|others dialectic with respect to agency. The tension lies between the individual agency "self" and the agency of "the others." The control repertoire illustrates the relationship between how individuals act and can act, on the one hand, and how the group or society they live in acts and can act, on the other. For example, in answer to an interviewer's question about the impact of a single person on the environment, one can observe the control repertoire.

Michael: They [single persons] are not useless, but they don't stand the same chance as they would in a group. They unfortunately don't stand a chance.

As observed here, the relationship between the two actors usually appears to be antagonistic. Thus the locus of control lies outside of the specific individual and emphasis is placed on heteronomy.

5. The making of post-ecological discourse

In this section, we demonstrate how the four interpretive repertoires constitute the 10 dimensions of post-ecologist discourse (Table 1).

Dimension 1: acceptance of the in-principle relevance of environmental issues. The first dimension of post-ecologism articulates (a) general and full acceptance of the in-principle relevance of environmental issues, and (b) the warning that the environmental crisis must not be overstated despite its seriousness (Dimension 1, Table 1). Talk about the first aspect (a) can be understood in terms of a combination of the folk science and pragmatist repertoires as shown in the following interview excerpt.

Interviewer: Something you said struck me. You said we are going to destroy our world. Do you really think that this is true?

Eric: Yes. We don't want to believe it, but it is true. We destroy it a little more every day.

Interviewer: In what ways do you think we destroy the world? I mean, there are few who have expressed it so clearly, no?

Eric: Well, we have the greenhouse effect, global warming, every day more cars are being driven on the streets, especially in America and Japan and nobody cares, but here [in Switzerland] we care more. It's simply so, the profits continue to grow more and more, and so does the clearing of the woods.

In this excerpt about the environmental future, the folk science repertoire is at work. Environmental destruction is conceived as a machine inevitably encroaching more and more on humans' lives. The input into the machine is people's environmentally-unfriendly behavior (greed for more profits, deforestation, etc.). The inner workings of the machine are scientifically labeled as the greenhouse effect, global warming, the ozone hole, and so on. The output is the ongoing destruction of the world. This point of view is developed from information accumulated from the media, personal experiences, and school science education – without differentiating between sources. This information is taken as reality and the step from "facts" to their scientific or medial interpretation (the greenhouse effect, global warming, etc.) is lost in this form of discourse. The result is the unquestionable and inevitable truth: an ominous future. The *general and full acceptance of the importance of environmental protection* is a direct consequence of the impact generated by the folk science repertoire. If the machine malfunctions, the point is raised in talk that something must be done.

However, there is another characteristic of this dimension, which can be observed in the following response to a question about the importance of environmental protection.

Andrea: Well, in theory, environmental protection is very important. But in fact, we can't handle it at all. If you only were to focus on environmental protection, then the economy would crash. All the emissions; they are unavoidable. Atomic plants, we need them too, without them there wouldn't be any electricity. And so we can't care that much about the environment.

At this point the pragmatist repertoire is at work. The pragmatist repertoire mobilizes practical arguments in opposition to ideal stances (i.e. "in theory"). The student, Andrea, argues in favor of atomic plants because society needs electricity while in this discourse, an "ideal" stance would be to abstain from constructing atomic plants because of value judgments not made explicit in the talk. The pragmatist repertoire often carries a mocking and ironic tone towards attitudes depicted as belonging to an ideal world. In the interviews, the tone of students' voices is at times angry and aggressive. This is the case, for example, when students explain that a local shopping mall could not be built as intended because the Swiss Traffic Club, an ecologically-oriented automobile club, intervened politically to prevent the construction of the mall.

Dimension 2: replacement of the emancipatory subject-oriented notion of modernization. The pragmatist repertoire also accounts for the production of the second dimension of the post-ecologist discourse (Table 1). The construction of a new shopping mall, for example, combined with a food court and recreational area represents innovation and change as intrinsic values. The students rarely provided concrete reasons why this project should be supported. The argument is driven by an intrinsic pragmatist impetus against "extreme" (idealistic) positions. Innovation and progress are goals in themselves.

Dimension 3: neo-materialist and consumption-oriented patterns. In talk about the third dimension of post-ecologist discourse, we tend to observe the folk psychology repertoire. Take the following example where a student answers the interviewer's question about consumerism and environmental protection.

Melanie: I think our generation doesn't really care. Everything is cheap; people can buy low priced clothes. They don't think about environmental protection. They realize that it is cheap, and then they buy it [. . .] Simply speaking, this is how it is today. You simply do it, you buy cheap clothes and you don't think about it any further.

This talk describing a generation that would not care about environmental protection when it comes to consumption is realized through the folk psychology repertoire. In the excerpt, a grammatically impersonal form is used, which demonstrates the finalizing power of the folk psychology repertoire. The repeated use of the word "simply" reinforces this form of talk, "Simply speaking, this is how it is today," where consumerism is articulated in terms of undisputed societal norm. Another allusion to the finalizing power of this repertoire is made in talk where students state that there is no possibility people consider the environment in their decision-making. The student, Melanie, emphasizes this when she refers to people who "don't think about environmental protection"; there is no room for further argument.

Another repertoire is frequently mobilized in talk about consumerism. The following excerpt starts with a remark that buying essential goods is not a problem as such.

Noah: It depends on what one buys. Human beings have some basic needs, so if they confined themselves to those, then it would work and it would be good. However, the problem is if we want technology to progress, then we have to invest money. One has to invest in researchers, instruments, and development [Entwicklung], it is simply expensive. I mean, you can't simply stop progress.

From the construction of Noah's argumentation, one might anticipate that the argument would proceed to name unrestrained consumerism as "the real problem." However, the discourse highlights instead that consumption drives progress because monetary investments are crucial to technological development (the student uses the term "Entwicklung," which in Swiss German always has a positive connotation).

An analysis of this passage provides important insight into the linkage between the pragmatist and folk science repertoires. The pragmatist repertoire is used insofar as it shows the typical structure of a pragmatist argumentation: if people consumed only basic goods, this would be ideal; however, in reality this would be a problem because consumerism drives technological progress by means of the money it generates. The pragmatist repertoire thereby compares ideal values with practical goals. When the folk science repertoire operates, demarcation between the ideal and real becomes possible. Real goals are rooted in the realm of science and technology; ideal values are not. Investing in researchers, instruments, and scientific/technological development are considered real goals that need no further argumentation. Progress and development are presented as reflections of techno-scientific facts and truths, thus need no further justification.

Dimension 4: disillusionment about the participatory revolution. In the following excerpt from a class discussion, the agency of a single person in environmental protection is assessed.

Henrik: Well, I think now that one person acting alone is nothing. You need lots of people to get involved, a single person is useless.

Interviewer: So it makes no sense for a single person to do anything?

Henrik: Sure, he can try to influence others. He can say something and then perhaps [he shrugs his shoulder].

Gian: I think you can always do something. But if somebody has little power and little influence, then you've got to ask yourself if this will have any effect.

Here, use of the control repertoire results in questioning the role of an emancipatory subject. Frequently found in the database and observed in this example is the antagonistic version of this repertoire. Typically, anonymous "others" stand in an oppositional relationship to the individual. An antagonistic relation between self and others blocks all sensible action that might otherwise bring about improvements for the environment. The antagonistic version of the agential repertoire assumes heteronomy: locus of control is with the others. This is typically situated on a communicative level and it is interpreted through the discourse in terms of self lacking influence.

Additionally, this argument is also a *call for political leadership,* which can be identified in the following excerpt.

Dorian: I, too, think that if only one group does something for environmental protection, it is useless. The presidents from every country should come together at some time. For example, I don't know if America does something alone, an Eskimo in Lapland will ever learn that they [the Americans] want to do something for the environment.

In this excerpt, support is expressed for peers' skepticism about an individual's impact. One group alone which engages in environmental protection is deemed ineffective ("useless"). Therefore, it is proposed that presidents of all countries should collaborate. Only then, as this argument suggests, "an Eskimo in Lapland" would learn about environmental initiatives. This is an organizational argument. The actual player in the background of this discourse is the metaphor of society, a giant machine, which has to be steered towards environmental protection. Thus one observes the folk science repertoire at work; generally, in interviews with the students, this pattern in talk about politics and politicians is visible. This is not as surprising as it may appear at first because within the

Social Sciences society can also be viewed as a system. As a result, politicians are not seen as representatives of power, but as experts of the social machinery.

In the same way, *Dimension 5* of post-ecologism – *relegation of environmental issues on the political priority list to a position behind employment, security, economic growth, crime and immigration* – can be understood as the interplay between the pragmatist and the folk science repertoire. In fact, the pragmatist repertoire provides many reasons why environmental protection is only one of many problems in the real world. Unrest (lack of personal and social peace, "peace in this world"), racism and immigration problems, or poverty, are as important concerns as environmental damage in the interviews. In the context of the pragmatist repertoire, these concerns are articulated from a practical point of view, and often combined with elements of the folk science repertoire. Environmental protection is seen as one problem among many preventing societal machinery from functioning.

Dimension 6: institutionalization of environmental concerns. Within the concept of societal machinery, environmental agency obtains an impersonal, *institutionalized* quality. Environmental protection is not described in terms of personal values but in terms of an instrumental assessment of the societal machine's needs. The folk science repertoire allows conclusions that personal attitudes are less important than "societal technology." Such discourse is exemplified in Noah's talk about personal attitudes.

Noah: Of course you need a different attitude. But attitude alone is pointless. If I only were to separate my rubbish and have solar panels on my roof, that would not be enough, we need technology. We need the economy and we need the state's money.

Noah stated in a previous excerpt included in this article that consumption drives progress and that politicians need to coordinate environmental efforts. Other students supported him during the discussion. They draw on the folk science and control repertoires, which results in proposals of various forms of "social engineering." The following excerpt is one example.

Michelle: (Laughs) It is difficult. It is useless. If only one person makes an effort, then it is useless. If you want to achieve something, then you must do some advertising or something else. So that others also start to reflect.

Interviewer: If you did some advertising, would that really be useful?

Michelle: I think it would not be very useful. Most people wouldn't read it, if one were to distribute flyers, for example. One had to arrange a big event, where people from all parts of the country could come to. Then one would get enough people, perhaps.

The first argument draws on the control repertoire but the remainder of the excerpt is solely about "social technology" based on the folk science repertoire. The question of how to mobilize enough people for a certain event is essentially independent from its goal. It is about expertise, not about values. The *experts* (Dimension 6, part 2) are hidden in the particle "one." In Swiss German, this impersonal form ([man]) is used to describe "faceless" officials in an expert role. In the database, it was frequently observable in reflections on the organization of environmental protection. In the instance above, public relations officers, technicians, and politicians, and so on, may be referred to. In the students' discourse, talk about politicians primarily addresses them as experts rather than as people in leadership.

Dimension 7: ecological problems as scientific, technological, economic or managerial issues. The folk science repertoire affords talk about environmental protection in terms of social engineering rather than in terms of changing attitudes. Environmental protection becomes a *managerial issue* and it can also become a *scientific* or a *technological issue*, thus reflecting a core constellation of the folk science repertoire. Technology is a means of producing a real impact on real situations. In the following transcript, we observe in discourse why an individual need not have concerns about the ecological future.

Benedikt: Why, well, as for cars, they are doing research with new hydrogen things, or they want to do something like that. So, I needn't care about that.

Interviewer: So, you actually believe in technology?

Benedikt: Yes.

Interviewer: Are there others who also believe in technology and that problems will be solved through technology?

Mara: Well, yes, sure. They will do something. They always find something.

Interviewer: And you feel that technology rather than energy-saving or something like that will be the solution?

Mara: Yes, I think so.

Once again, the impersonal reference to experts is salient. The folk science repertoire shifts responsibility for environmental protection from human subjects to anonymous experts. This example also demonstrates why the category of "folk" science repertoire was chosen rather than that of the science repertoire. This discourse does not require expertise on technological issues, for example, the talk may be about "hydrogen things" (Benedikt) or about "the[m] always find[ing] something" (Mara). In this discourse, issues often remain vague and sometimes incorrect from a scientific perspective. The folk science repertoire does not intend to speak scientifically correctly but combines information about scientific issues with personal experience in a causal logical argument. Another way in which this discourse operates is by reformulating environmental problems *in terms of economic issues*. Then, environmental protection is often deemed to be too expensive.

The folk science and pragmatist repertoires support the expression of preferences for technological solutions over behavioral changes. Sometimes, these also result in deep skepticism concerning *visions of a radically different ecological society* (Dimension 8).

Dimension 9: political pragmatism and economic growth, technological progress and global competition. The pragmatist repertoire reconstructs activity in terms of practical goals and rejects idealistic stances; the folk psychology repertoire does the same with personal attitudes and rejects *dogmatic visions*. Talk about attitudes in terms of the folk psychology repertoire does not conceive people as emancipated subjects with individual views but as representatives of general attitudes which reflect commonly held opinions. As a consequence, these discursive resources do not provide the required means for formulating opposition of the individual against social trends, such as *economic growth, technological progress and global competition* (Dimension 9). This can be seen at work in the following interview excerpt.

Tamara: I've never thought about it [economic growth, technological progress and global competition]. I think it is in fact okay. One should always take three steps forward and not look back. If we bring new cars onto the market, then they should run on natural gas and so on, then you should proceed slowly and build it up. Well [hesitates], both options are good and bad.

In this excerpt, the folk psychology repertoire is at work: "one" should always step forward and "not look back." The direction of the argument then changes so that one should "proceed slowly and then build it up." Yet the result remains open: it is "good and bad." In the database, discourse is frequently encountered in which hesitant and ambivalent attitudes are expressed vis-à-vis "globalization, progress, and economic growth."

Dimension 10: radical ecologism and direct eco-political action as variants of terrorism. Sometimes the pragmatist repertoire shows latent irony. In an ideal world, ecological aims would be of prime importance. In our real world, however, economic goals take precedence. Sometimes the ironic stance toward attitudes of an ideal world turns into an aggressive complaint about people who "have their heads in the clouds." Through this discourse, "left-wing" and "green" politics are criticized as exaggerated, extremist and destructive. In this discourse indignation is also expressed towards the breaking of discursive rules. Those who question the priority of economic goals and the importance of concerns other than ecological ones, or even obstruct them, break the rules articulated in the pragmatist repertoire. These people are therefore blamed for being dangerous to an otherwise prosperous society. An extreme version of this reaction pattern is the *criminalization of radical ecologists* (Dimension 10). In our database, there are no examples of members of NGOs being called terrorists, but the discourse makes apparent aversions to so-called radical social engagement.

5. Discussion: Interpretive repertoires are the building blocks of post-ecologist discourse

The analysis demonstrates how the commonsense repertoire, consisting of the folk science and the folk psychology repertoire, supports a fact-oriented interpretation and articulation of the physical and mental world. When scientific information is processed through the folk science repertoire, scientific facts can mutate into Facts with a capital F (Latour, 1999). In the folk science discourse, these Facts cluster together to form an unquestionable and invariable Truth. The same applies to the folk psychology repertoire; it allows for the generation of social Facts and Truths that are conceived as unquestionably, invariably and universally mandatory. In the database, this pattern can be observed whenever discourse mobilizes the commonsense repertoire. It is a discourse that forces people into a confined world of unchangeable Facts which hinder their agency.

The agential repertoire, consisting of the pragmatist and control repertoires, produces similar effects (not only in the context of post-ecologism, but also in any other discursive context.) The pragmatist repertoire will use material "facts," provided by the folk science repertoire, for distinguishing between "ideal" concepts, on the one hand, and practical goals and "real" concerns of the factual world, on the other. The control repertoire points out that individual action is ineffective by referring to the opposition of the "others" described by the folk psychology repertoire. This mechanism entails a shift towards talk of individual loss of control as observed among the students. Therefore, the analysis may be seen and understood as an exemplary demonstration of how the interplay of these interpretive repertoires produces descriptions about individual control.

The discourse, locked between the commonsense repertoire in its two variations (folk science and folk psychology) and the agential repertoire in its two variations (pragmatist and control repertoire), results in an articulation of the loss of ecological control. This is not without consequences because "the perception of personal control is one of the most significant aspects of an individual's self-perception" (Falomir et al., 2000: 443). Beliefs about control are regarded as essential in determining decisions and action. These are prerequisites for planning, initiating and regulating goal-oriented actions and they are part of the concept of self. The control discourse articulates feelings of self-esteem that bring about emotional states including pride, shame, or depression (Flammer, 1995). We come to the perhaps surprising conclusion that post-ecologism might be a symptom of environmental depression, based on the loss of articulated agency with respect to the environment and environmental protection.

Consequently, the analysis demonstrates how public understandings of science may be affected by unintended nontrivial consequences (here an unintended environmental depression) of the talk itself, that is, by inherent characteristics of involved repertoires, especially the folk science repertoire. The study implies that fostering the public understanding of science is not merely a question of providing scientific facts for the public, but it is also a matter of paying attention to available discursive repertoires. Viable alternatives may have to be offered for the talk about these facts. Based on recent findings in research of science education, several alternative approaches can be suggested. One approach is to engage in conver-

sations about the nature of science, which is a context wherein students can learn to employ alternative interpretive repertoires instead of only using the folk science repertoire. Addressing questions about the nature of science (Abd-El-Khalick & Lederman, 2000), students may start to question the predominance of the folk science repertoire. They will learn to reconsider the constructed Facts and Truths, their meanings and their interpretations, both in terms of scientific correctness and cultural-historical construction. In this context, Philosophy and the History of Science might be important sources of alternative repertoires (Cobern & Loving, 2007).

Complexity theory and its relevance to science education (Fensham, 2008) may be another source for repertoires other than the folk science repertoire. This repertoire normally assumes linear "machine" mechanisms. By drawing on alternative repertoires provided by complexity theory, environmental issues may be more appropriately considered. A correctly adopted complexity discourse could also produce alternative conclusions about the impact of small environmental changes. Instead of resulting in conclusions that focus on an individual's "loss of control," a consequence of the abundant use of the control repertoire, it might indicate possible non-linear effects of small changes made by an individual.

Furthermore, informal reasoning about socio-scientific issues (Sadler, 2004) can enrich the instruments of talk about the social aspects of environmental protection. The Facts and Truths produced by the folk psychology repertoire could be questioned by alternative repertoires which do not conceive "the others" in terms of an "alter ego." To achieve this, it may be important to talk science in an interdisciplinary setting involving Psychology and Sociology. Such an interdisciplinary setting may also be helpful in instilling a different value discourse than the one produced by the frequent use of the pragmatist repertoire, which tends to construct an opposition between "real" goals and "ideal" values as the analysis has shown. In this context, new repertoires that originate from applied ethics and avoid meta-ethical realism may be helpful (Zeyer, 2005, 2009).

The common goal of such approaches is to prevent the environment and environmental protection discourse from being confined to a rigid framework of a few dominant discursive repertoires as identified in the analysis. By adopting the aforementioned approaches, talking science can suitably encourage pro-environmental views among young people.

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